

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in this application.

1. (Currently Amended) A method to correct a phase of a received phase modulated (PM) signal, comprising:

applying a received phase modulated (PM) signal to a first circuit branch and a second circuit branch;

in the first circuit branch, selecting  $k$  data bits from the received PM signal, wherein a data bit received most recently corresponds to time  $t_1$  and wherein  $k$  is an integer greater than 1;

determining a phase error based on the  $k$  data bits;

in the second circuit branch, delaying the received PM signal to a second time  $t_2$  that is later than  $t_1$ ;

applying the phase error to at least a portion of the delayed PM signal at the second time  $t_2$ ;

calculating a phase offset ~~from~~ based on the delayed PM signal; and

using the phase offset to correct the phase of a PM signal received at a time later than  $t_1$ .

2. (Original) The method of claim 1 wherein selecting  $k$  data bits comprises arranging the  $k$  data bits serially so as to alternate between in-phase and quadrature bits.

3. (Original) The method of claim 1 further comprising:

setting  $k$  equal to a total number of data bits that influence the phase of the received PM signal at the first time  $t_1$ .

4. (Currently Amended) The method of claim 1 wherein  $k=1+\frac{1}{BT}$ , wherein  $B$  is a bandwidth of the received PM signal and  $T$  is a bit interval of the received PM signal.

5. (Currently Amended) The method of claim 1 wherein determining ~~a~~ the phase error includes accessing, using the  $k$  data bits, a lookup table.

6. (Currently Amended) The method of claim 5 wherein determining ~~a~~the phase error further comprises inverting an output of the lookup table when the most recent data bit is one of an in-phase or a quadrature data bit.

7. (Currently Amended) The method of claim 1 wherein determining ~~a~~the phase error based on the  $k$  data bits comprises correlating the  $k$  data bits except the most recent data bit with a derivative with respect to phase of a conjugate of a reconstructed waveform.

8. (Currently Amended) The method of claim 7 wherein the derivative with respect to the phase is stored in a lookup table.

9. (Original) A circuit to correct a phase of a phase modulated (PM) signal, comprising:

    a first circuit branch wherein a primary phase shifter, a register, one of an algorithm sub-circuit and a lookup table sub-circuit, and a loop phase shifter are arranged in electrical series, in that order;

    a second circuit branch having an input in parallel with the first circuit branch, wherein a delay block and the loop phase shifter are arranged in electrical series, in that order;

    the register for storing at least two data bits sampled from the PM signal; and

    the loop phase shifter having an output coupled to an input of the primary phase shifter.

10. (Original) The circuit of claim 9 wherein the at least two data bits comprises a series that alternates between an in-phase bit and a quadrature bit.

11. (Currently Amended) The circuit of claim 10 wherein the first circuit branch further comprises a ~~complementor~~complement block disposed between the loop phase shifter and the one of ~~an~~the algorithm sub-circuit and ~~a~~the lookup table sub-circuit.

12. (Currently Amended) The circuit of claim 9 wherein the at least two data bits comprises  $k=n(1+\frac{1}{BT})$  data bits, wherein  $n$  is a number of samples per bit interval that is greater than or equal to one,  $B$  is a bandwidth of the ~~received-PM~~ PM signal and  $T$  is a bit interval of the ~~received-PM~~ PM signal.

13. (Currently Amended) The circuit of claim 9 wherein the one of the algorithm sub-circuit and the lookup table sub-circuit produces the phase correction by correlating all data bits in the register, except the most recent data bit, with a derivative with respect to phase of a conjugate of a waveform reconstructed from the ~~received-PM~~ PM signal.